

REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-14 are in this case. Claims 1-7 have been rejected under § 102(b). Claim 1 has been rejected under § 102(e). Claims 8-14 have been rejected under § 103(a). Independent claim 1 has been amended. New independent claims 15 and 16 have been added.

The claims before the Examiner are directed toward an electronic module that includes electronic circuitry and first and second electrical connection mechanisms, both operationally connected to the electronic circuitry, for mounting the module on a printed circuit board by different respective methods.

§ 102(b) Rejections – Persegol et al. '915

The Examiner has rejected claims 1-4 and 6 under § 102(b) as being anticipated by Persegol et al., US Patent No. 6,204,915 (henceforth, "Persegol et al. '915"). The Examiner's rejection is respectfully traversed.

Persegol et al. '915 teach an electronic module 10 for coupling an optical sensor such as sensor 25 to a processing circuit 6. Module 10 includes two connection mechanisms: electrical connector 15 for connecting module 10 to processing circuit 6 and optical fiber 13 for connecting module 10 to sensor 25.

To distinguish the present invention from Persegol et al. '915 it would suffice to amend claim 1 to state that both connection mechanisms are electrical connection mechanisms, as opposed to the connection mechanisms of Persegol et al. '915, one of which is optical. However, such an amendment might not suffice to distinguish the present invention from certain other prior art references cited by the Examiner.

Therefore, claim 1 has been amended to state that both connection mechanisms are for mounting the electronic module on a printed circuit board. By contrast, neither connection mechanism of Persegol et al. '915 is for mounting electronic module 10 on a printed circuit board; and there is neither a hint nor a suggestion in Persegol et al. '915 of providing an electronic module with two different connection mechanisms for mounting the electronic module on a printed circuit board.

Support for this amendment is found in several places in the specification, notably page 1 lines 14-17:

The present invention relates to an electronic module adapted to be operationally connected to a larger electronic device in either of two different ways and, more particularly, to an electronic module adapted to be connected to a printed circuit board (PCB) either robotically or manually.

page 4 lines 6-10:

The first connection mechanism is for mounting the electronic module within a larger electronic device (and typically on a PCB) by a first method. The second mechanism is for mounting the electronic module within a larger electronic device (again, typically, on a PCB) by a second method that is different from the first method.

page 6 lines 8-10:

The present invention is of an electronic module that can be mounted in a larger electronic device by one of two different methods. Specifically, the present invention can be mounted on a PCB either robotically or manually.

and page 6 line 22 to page 7 line 3:

When module 30 is mounted on a compatible PCB (not shown) by an SMT robot, each solder ball of BGA 1 is melted to form an electrical connection between the solder ball's respective wire and matching electrical connectors on the PCB. When module 30 is manually plugged into a compatible socket of a PCB (not shown), each pad of plug 2 comes into electrical contact with a matching pad that is part of the socket, establishing electrical contact between the PCB and electronic circuitry 4 via wire pluralities 7 and 9. (emphasis added)

Amended independent claim 1 now features language which makes it absolutely clear that both connection mechanisms of the present invention are for mounting the electronic module on a printed circuit board. Applicant believes that the amendment of the claims completely overcomes the Examiner's rejections over Persegol et al. '915. In fact, as discussed below, Applicant believes that the amendment of the claims completely overcomes all the Examiner's rejections on § 102(b) and § 102(e) grounds. With independent claim 1 allowable in its present form it follows that claims 2-4 and 6 that depend therefrom also are allowable.

§ 102(b) Rejections – Park et al. '259

The Examiner has rejected claims 1-3 and 5-7 under § 102(b) as being anticipated by Park et al., US Patent No. 6,222,259 (henceforth, "Park et al. '259"). The Examiner's rejection is respectfully traversed.

Park et al. '259 teach an electronic module 30 with two connection mechanisms: a metal wire 100 and a solder ball 150. Of these two connection mechanisms, only solder ball 150 is suitable for mounting electronic module 30 on a printed circuit board. Metal wire 100 is for connecting electronic module 30 to another, similar electronic module 40, not for mounting electronic module 30 on a printed circuit board. There is neither a hint nor a suggestion in Park et al. '259 of providing an electronic module with two different connection mechanisms for mounting the electronic module on a printed circuit board. Therefore, the amendment discussed above in the context of Persegol et al. '915 renders claim 1 allowable over Park et al. '259 too. With independent claim 1 allowable in its present form it follows that claims 2, 3 and 5-7 that depend therefrom also are allowable.

§ 102(e) Rejections – Hashimoto ‘718

The Examiner has rejected claim 1 under § 102(e) as being anticipated by Hashimoto, US Patent No. 6,483,718 (henceforth, “Hashimoto ‘718”). The Examiner’s rejection is respectfully traversed.

Hashimoto ‘718 teaches a stack 3 of semiconductor chips whose respective electronic circuits are connected to each other by terminals 240. The bottommost semiconductor chip 10 also is provided with terminals 250 for external connection of stack 3 as a whole. Thus, the bottommost semiconductor chip 10 is a electronic module with two connection mechanisms; but, as in the case of Park et al. ‘259, only one of these connection mechanisms is suitable for mounting the bottommost semiconductor chip 10 on a printed circuit board. Terminals 250 are for forming electrical connections within stack 3. This is best seen in Figure 5 in which stack 3 is mounted on printed circuit board 1000 via terminals 250 and solder balls 260. There is neither a hint nor a suggestion in Hashimoto ‘718 of providing an electronic module with two different connection mechanisms for mounting the electronic module on a printed circuit board. Therefore, the amendment discussed above in the context of Persegol et al. ‘915 renders claim 1 allowable over Hashimoto ‘718 too.

§ 103(a) Rejections – Hashimoto ‘718 in view of Bielick et al. ‘512

The Examiner has rejected claims 8-12 under § 103(a) as being unpatentable over Hashimoto ‘718 in view of Bielick et al., US Patent No. 5,873,512. The Examiner’s rejection is respectfully traversed.

It is demonstrated above that independent claim 1 is allowable in its present form. It follows that claims 8-12 that depend therefrom also are allowable.

§ 103(a) Rejections – Persegol ‘et al. ‘915 in view of Suzuki et al. ‘381

The Examiner has rejected claims 13 and 14 under § 103(a) as being unpatentable over Persegol et al. ‘915 in view of Suzuki et al., US Patent No. 5,045,381 (henceforth, “Suzuki et al. ‘381”). The Examiner’s rejection is respectfully traversed.

It is demonstrated above that independent claim 1 is allowable in its present form. It follows that claims 13 and 14 that depend therefrom also are allowable.

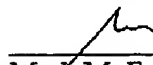
New Claims

As discussed above in the context of the § 102(b) rejections, amending claim 1 to recite specifically electrical connections would have sufficed to render claim 1 patentable over Persegol et al. ‘915. Such an amendment also would have sufficed to render patentable claim 4 that was rejected only over Persegol et al. ‘915 and claims 13 and 14 that were rejected over the combination of Persegol et al. ‘915 and Suzuki et al. ‘381. Therefore, new claims 15 and 16 have been introduced. New claim 15 is claim 4 as filed, rewritten in independent form and amended to state that both connection mechanisms are electrical. New claim 16 is claim 13 as filed, rewritten in independent form and amended to state that both connection mechanisms are electrical.

Support for the connection mechanisms being electrical is found in the specification in Figures 7-9 and the accompanying text. In Figures 7-9, both ball grid array 1 and plug 2 are electrical connection mechanisms for electronic circuitry 4.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1, 15 and 16, and hence dependent claims 2-14 are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



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